

ASPECTS OF THE ECOLOGY OF  
CROWNED CRANES *BALEARICA REGULORUM*<sup>1</sup>

IN UGANDA

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Crowned Cranes are widespread in the wetter areas of Uganda, and are particularly common in the southeast (Paget-Wilkes 1938) where swamps are frequent. They are sparse in areas with less than 700-800 mm of rain per year. The species is found in open grasslands as well as near swamps but is generally less common in the formerly forested areas of south central Uganda.

The vociferous displays of *Balearica* cranes have long attracted the attention of naturalists (e.g. Serle 1939) but only one general account of either species exists, and it refers mainly to *B.r. regulorum* in southern Africa (Walkinshaw 1964).

Between 1969 and 1973 I kept records of Crowned Cranes seen in various parts of Uganda, through which I travelled widely. More detailed observations were made on two flocks of cranes near Kampala. One of these frequented the municipal rubbish tips at Kololo and Natete (Pomeroy 1975), whilst the other was found on one or both of two large farms some 15-20 km north of Kampala. These were the University Farm of about 100 ha at Kabanyolo, and the Cotton Research Station at Namulonge. Each had areas of cultivation interspersed with extensive pastures.

FEEDING AND OTHER BEHAVIOUR

Crowned Cranes have a varied diet. Mackworth-Praed & Grant (1957) mention lizards, grasshoppers and seeds, also stating that cranes can cause considerable damage to young crops. Captive birds can thrive on a diet which is almost exclusively vegetarian (F.C. Astles, *in litt.*) but prefer insects and earthworms (Clarke & Amadei 1969, pers. obs.). When walking through grass, wild Crowned Cranes sometimes 'stamp' their feet, presumably to disturb insects, and their accompanying rapid pecking behaviour is suggestive of taking insect prey. G.R. Cunningham-van Someren (pers. comm.) has recorded Crowned Cranes feeding on cutworms (noctuid moths) and armyworm (*Spodoptera* spp.) in Kenya, and crickets (gryllids) in the Sudan. On several occasions birds were observed walking amongst feeding cattle, much as Cattle Egrets *Bubulcus ibis* do when taking disturbed grasshoppers, but did not approach so closely. Freshly-ploughed fields attract Crowned Cranes in preference to grassland, and short grass is preferred to long, but they will feed in long grasses around swamps and elsewhere, when the plants are seeding. Seed-heads of sedges *Cyperus* spp. and of grasses such as *Cynodon* spp. are preferred plant foods, the birds pecking them repeatedly. At the Kampala rubbish tips feeding was most active on freshly-tipped refuse, which, although mainly vegetable in origin, attracted many insects. The Crowned Cranes pecked actively at old maize cobs, attempting to knock off edible fragments with their bills; the feet were not used. In captivity, the birds preferred to knock seeds off millet and maize cobs, rather than take loose ones.

Damage to crops can be extensive, especially to annual crops in large fields. At the University Farm, soya beans and groundnuts were most affected, and losses of up to 50 per cent were reported by the Manager. Damage was worst towards the end of the dry season when, presumably, insects were harder to find. Bean flowers and pods were sometimes attacked as well. Damage to

<sup>1</sup>I prefer to recognize two species of *Balearica*: *regulorum* and *pavonina*.

plants can also be indirect, as in the case of cotton seedlings; plants were uprooted, apparently in a search for insects (R. Passmore, pers. comm.) and, like other young crops, cotton can be damaged badly by the trampling of displaying cranes.

Crowned Cranes roost in trees, showing a distinct preference for open trees such as mvule *Chlorophora excelsa* whose high, bare lower branches command a good view, or the tops of leafless trees. They leave the roost at dawn, or up to an hour later on wet or misty mornings and do not return until just before nightfall. During the day, they feed for between half and three-quarters of the time, being least active around mid-day. In hot weather birds in the sun pant visibly, but where possible they move into shade. Even within large flocks, birds can often be seen moving in pairs, suggesting that pairing lasts for two or more breeding seasons. Displays within the flock are not infrequent, and usually involve mutual displays by pairs of birds. Mutual preening also occurs, especially of the neck. Displays amongst feeding birds may occur at any time, some being in response to minor disturbances. They involve much calling and 'dancing', as well as head-bobbing and other components performed standing or running. Displays by one pair in a flock often stimulate others to start. Most displays involve only a few birds, but as evening approaches the frequency increases as does the number of birds taking part, until the whole flock becomes involved. The displays rarely last more than a few minutes, and are interspersed with feeding.

#### BREEDING

In Uganda Crowned Cranes are most commonly seen in pairs (Fig.1) but family groups with one or two young are not infrequent. Groups of more than 20 are rare in Uganda, although there were two resident populations in the Kampala area during the study period. One, whose numbers were usually between 25 and

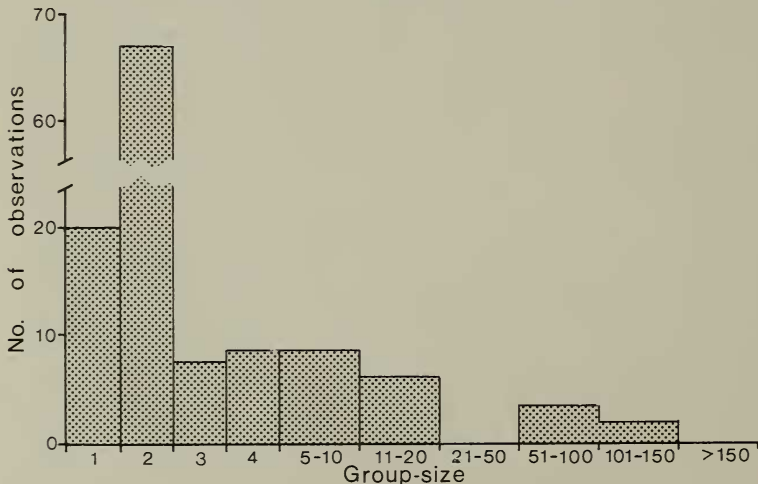


Fig.1 Sizes of 118 Crowned Crane groups in Uganda, outside the Kampala area

45, often in a single flock, frequented the municipal rubbish-tips at Natete and Kololo. A total of up to nearly 200 birds was almost always present on the large farms at Kabanyolo and Namulonge, usually divided into several groups, but occasionally they all came together in a single flock.

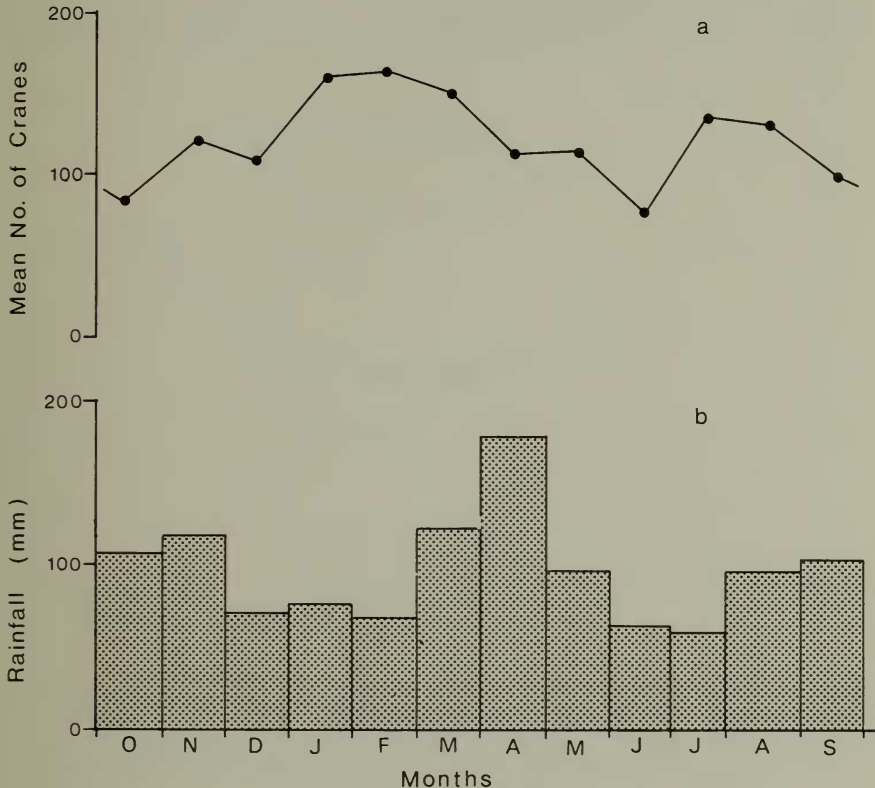


Fig.2 Mean numbers of Cranes in the Kabanyolo/Namulonge flock in 1970-72 (a), and long-term average rainfall in Kampala (b)

The sizes of the two populations varied seasonally, but not greatly. The Kabanyolo/Namulonge population was largest in the later dry season and early wet season (Fig.2). It tended to be smaller from November to February and from May to July, the main egg-laying periods (Fig.3c). During the breeding season, there was an increase in the number of birds seen in pairs, and a similar but smaller increase in the number of single birds (Fig.3a,b). The latter presumably represented the partners of incubating birds. Despite the clear seasonality in breeding, there are records of nesting for every month; the raw data from which Fig.3c was constructed show that, of 59 records, the monthly average was 6.1 for the nesting months of November to February and May to July, as compared to an average of 3.2 per month for the intervening periods.

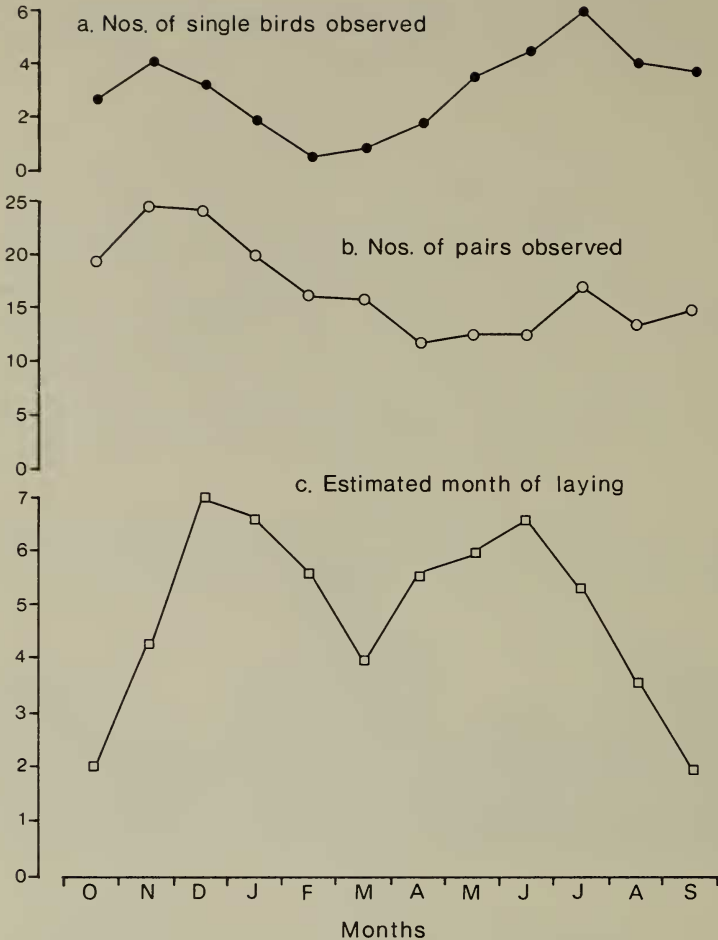


Fig.3 Seasonality in the breeding of Cranes in Uganda. In each case the data have been grouped into 3-point running means, e.g. the figure plotted for November is the average of the raw data for October, November and December. Records used for graphs a) and b) refer to the Kampala area only; the data for c) are from the whole of Uganda. 3c contains data from family parties with young whose ages could be estimated fairly accurately, as well as from EANHS Nest Record Cards

Most nests of Crowned Cranes are in grass swamps. They are bulky and are placed in the centre of an area, up to 20 m in diameter, where the vegetation has been trampled flat. This probably prevents surprise attacks by predators.

Data from the Nest Record Scheme of the East Africa Natural History Society show that the clutch-size varies with altitude. The mean for 12 nests in the

medium-altitude areas of southern Uganda, generally below 1500 m, was 2.17 eggs per nest. For highland areas above 1500 m (Kigezi in Uganda and the Kenya highlands) the average for 29 nests was 2.72. If we assume that the sample in each region can be considered statistically random, which it probably can, then the difference between them is clearly significant ( $t_{39} = 3.26, P < 0.01$ ). Many nest record cards gave figures for numbers of chicks, and it was often possible to estimate their approximate ages. In addition, I made observations on young of various ages in family groups. These data are summarized in Fig.4. The numbers of young surviving were, on average, very similar in both regions, so the

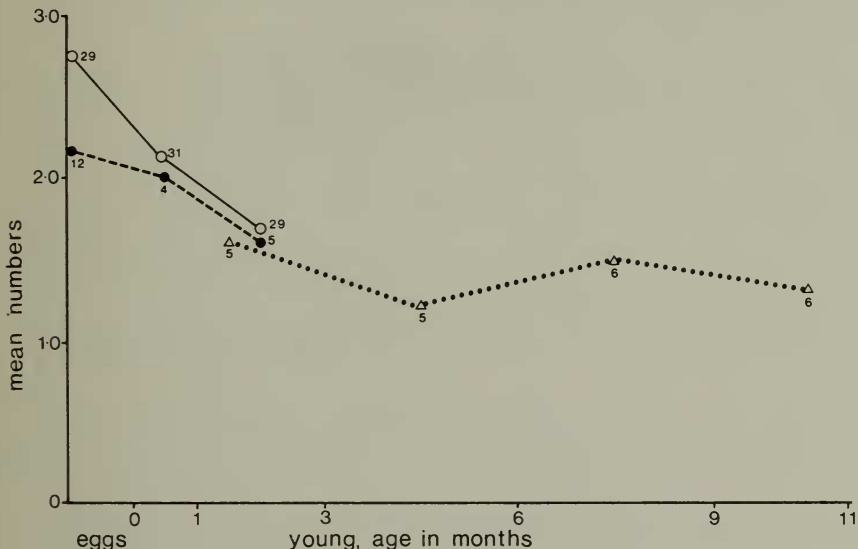


Fig.4 Breeding success of Cranes in Uganda and Kenya. The figures alongside each point are the number of observations. For details see text

○ ———— ○ highland areas } data from EANHS Nest Record Scheme  
 ● ———— ● medium altitudes }  
 △ ·········· △ medium altitude records - estimates based upon the author's observations

losses from highland nests were evidently greater. Those nests whose young survived beyond three months, produced an average of about 1.3 young per pair. Overall breeding success will have been less, but the proportion of unsuccessful nesting attempts is not known.

DISCUSSION

Cranes are omnivores, preferring invertebrates and, to a lesser extent, graniform seeds. They feed mainly in grasslands but require swamps for breeding and, where possible, large trees for roosting (although they will roost in shallow water (Walkinshaw 1964) or on smaller trees is necessary). Extensive areas of Uganda provide these conditions. Within this region Crowned Cranes are largely resident; there is no evidence of any but local movements.

The occurrence of some breeding records for all months of the year is best

explained in terms of a fluctuating climate. The most favourable time varies, as does rainfall, from year to year. Nevertheless, there are seasonal peaks, just as there are for rainfall when data for many years are averaged. The data from the Nest Record Cards show only one peak for Uganda, in December-January (Brown & Britton 1980), but the more extensive data included in the present account reveal two peaks, both in drier seasons. These are times when the nest is less likely to be flooded than during the rains; further, grass seeds and large grasshoppers are most abundant after the rains. The observations of Sessions (1966 and on Nest Record Cards) at Mau Narok, Kenya show that a pair can nest again after losing eggs or young; he recorded one pair which nested 12 times between 1960 and 1969.

The overall average clutch-size in Kenya and Uganda was 2.56 (41 nests), closely similar to the 2.44 (34 nests) reported by Walkinshaw (1964) for southern Africa. In Uganda, local informants told me that it was common for Crowned Cranes to nest without producing young: often they were disturbed. Those pairs which were successful in producing young had an average of about 1.3 per nest at hatching. Sessions' pair hatched 20 chicks from about 36 eggs, and averaged 12 young to independence, an average of 1.00 per nesting pair (data from Nest Record Cards). Young Crowned Cranes can be distinguished from sub-adults and adults up to an age of about one year (Pomeroy, in press). Young birds form a small proportion of the total seen (unpublished observations of L.H. Brown and the author) and this suggests that the overall breeding success is low. It may well fall within the range of 0.2 to 0.8 reported by Miller (1973) for the Sandhill Crane *Grus canadensis* of North America. Further evidence of the low overall production of young by Crowned Cranes is that even during the peak breeding times, some birds remain in flocks. However, some of these are likely to be sub-adults, which resemble adults closely in the field.

The finding of a relationship between clutch-size and altitude is interesting, despite its significance being obscure. Klomp's (1970) review of clutch-sizes mentions only four species in which such a difference had been reported, all being from northern latitudes; in three of them clutch-size decreased with altitude, whilst in the fourth it was related to laying-date. In the grassland *Vanellus* plovers of East Africa, the two which nest in higher or wetter areas (*V. melanopterus* and *V. lugubris*) lay 3-4 eggs, whereas *V. tectus* and *V. coronatus*, nesting in lower or drier areas, lay 2-3 eggs. This led Brown (in litt.) to suggest a correlation between clutch-size and rainfall. But the Crowned Crane data discussed in this paper relate to areas with similar, fairly high rainfall, at both medium and higher altitudes.

Outside Uganda, especially in drier areas, *Balearica* species breed in the wet season (Bannerman 1953, Benson, Brooke, Dowsett & Irwin 1973, Brown & Britton 1980). In these regions, flocks are characteristic of the non-breeding season. They are also a feature of the Kenya highlands; Jackson (1938) once saw about a thousand near Elmenteita. Flocks also occur in South Africa (Prozesky 1970), whilst in West Africa the largest published record of a flock of *B. pavonina* seems to be one of 400-500 in Tchad (Salvan 1967), although Brown, Urban & Newman (in press) suggest that much larger flocks can occur. In the Kampala area, although the flocks diminished during the breeding season, they never decreased to less than half their maximum size (see Fig.2).

Some species of cranes are seriously threatened with extinction, but *B. regulorum* is widespread and common in many areas. Although originally a species of open grasslands with swamps, it now frequents several man-made habitats as well, and has extended its diet to include various annual crops. Burke (1965) estimated the population of Crowned Cranes in Kisii District, western Kenya, to be 1.14 per square mile (about 2.9 km<sup>2</sup>). Large areas of

southern Uganda are likely to have at least one Crowned Crane per square kilometre, giving a total population of tens of thousands; moreover, this may well be increasing. Further, despite their potential as pests, most farmers do not seem to mind them: if they did, they could easily find and destroy the nests.

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